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American Telegraph Inventor in Europe.

On the 9th ult. a grand banquet was given to Prof. Morse in London by the English telegraph companies which have their head quarters in that city. Cyrus W. Field, of this city, who is the active agent of the New York and Atlantic Telegraph Co., and who is now in London on business relating to the laying of the great cable, was one of the guests.—Many compliments were paid to Prof. M., as the inventor of the electro-magnet telegraph—the most simple of all. Quite a number of distinguished guests were present, and Prof. M. stated he had telegraphed over the united wires which from London crossed the Irish Channel, and were 2,000 miles long, and had produced 210 signals per minute. He was of opinion that this proved the perfect practicability of working the proposed telegraph across the Atlantic ocean.

Sounding Guard for Vessels.

Any one reading the daily list of marine disasters, occasioned by vessels running ashore, must be convinced of the necessity of some means of preventing said accidents as far as possible.

It was such considerations as these that led to the invention of the Sounding Guard, of which the following is a description. Referring to the engraving, A is a movable vertical rod passing through the bottom close to the side of the keel, enclosed in a pipe, 1, 1, which pipe is bolted to guides at K K. With the lower end of the vertical rod are connected two others, B B, one leading forward and the other aft, the ends working freely in two castings, R, fixed on the garboard streak, so that they may slip as the center rod rises vertically.

By this arrangement, when a vessel passes over a rock or shoal, the inclined rods, B, being touched, causes the vertical rod to rise to the point at which it can pass over the obstacle, indicating on deck the actual clearance or number of feet under the bottom of the ship. The upper part of the rod is marked in feet or inches, and an alarm bell attached, so that when the guard touches bottom the bell is rung, and attention being thus called to the indicator, the depth of water may be accurately measured.

When in deep water, or in port, the machine is triced up alonside the keel, and a pin put through the vertical rod, at the spar deck. A bolt is put through the garboard plank at the after end of the forward grove to act as a *stop* for the forward bar, B. The head of the bolt is inside the ship, so that the stop may be raised when it is desired to detach the guard.

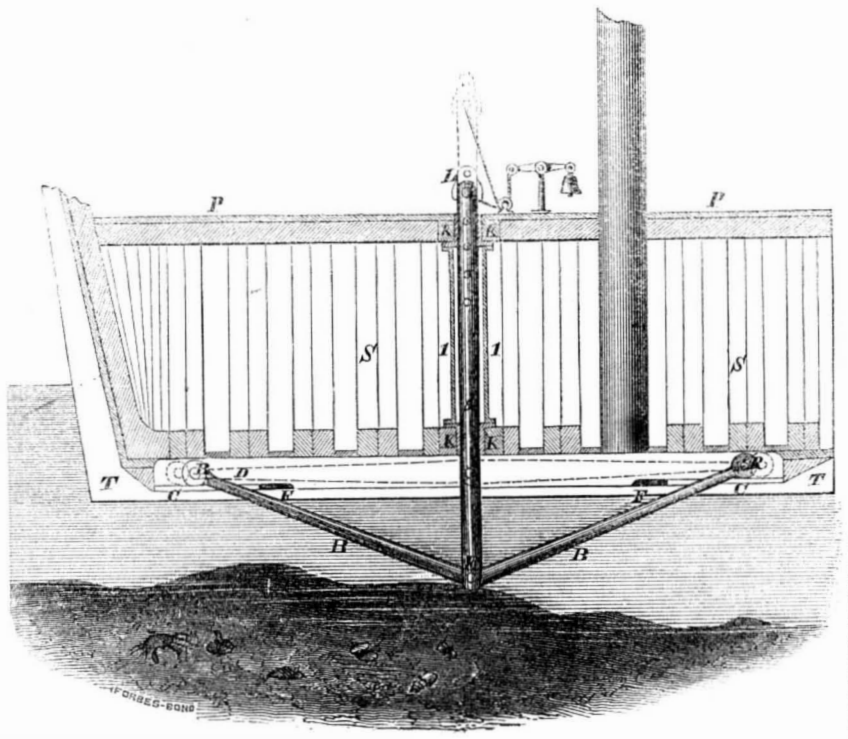
The proportion of the length of the inclined rods to the vertical one below the bottom are as 3 to 1, and it is believed that a a depth of two fathoms under the keel may be reached, the long rods then being put together with a joint and sleeve.

The advantages beside being a safe guard, are alleged to be, in part, as follows:—It will, in a great measure, dispense with the lead and leadsmen; it is constant in its action by day or night, and thus avoids the danger of going on shore between the casts of the lead, and also the uncertainty which always attends the use of the lead when the vessel is going fast, and at night when leadsmen so frequently make mistakes. In working up a channel it can be set to a safe depth, and the alarm given at the moment to tack. As in a sea way it goes down with the vessel, it always shows the least depth of water. At night, and in unknown channels, it will give a feeling of confidence to the navigator, which he cannot derive from lead and leadsmen.

If anchored in an open roadstead, blowing fresh, the vessel drags at night, the alarm will be given in time to save the vessel by letting go another anchor. For our lake and river steamers, sailing, and coasting vessels, which would require but a small machine that would be very easily managed, the Sounding Guard, it is believed, would be found very useful.

Address the inventor, Lieut. Jno. Guest, U. S.N., Washington D. C., for further information. Patented J 8, 1856.

NEW SOUNDING GUARD FOR VESSELS.



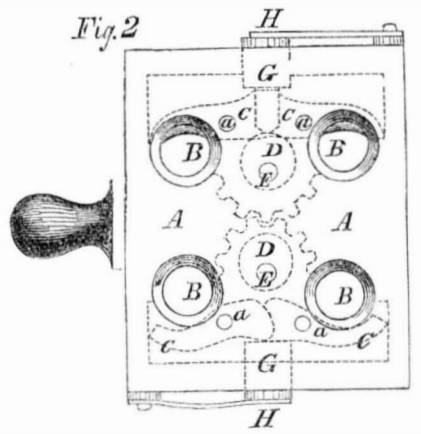
APPARATUS FOR MILKING COWS.

Fig. 1

Cow Milking Apparatus.

The contrivance illustrated by our engraving consists of a small box, A, which is held up to the cow by means of a handle on one side. The box contains four tubes, B, which receive the cows teats, as shown.—The requisite pressure to cause the milk to flow, is obtained by means of a series of fingers, C, which work out aud in upon the teats, though slots in tubes, B. The fingers, C, are operated by means of cams, D, on shafts, E. The latter are caused to revolve by the crank, F, and gear wheels, as shown. Figure 2 is an enlarged horizontal section, showing the arrangement and operation of the fingers, cams, &c. G are pins which at one end, bear against the cams, and at the other receive the force of springs, H. The latter serve to withdraw the fingers, C, after they have been pressed against the teats of the cows

Fig. 2



by cams, D. The bottoms of the tubes, B, all meet at a common center, B′, which terminates in a discharge pipe, H, through which the milk escapes into a pail or other receptacle below. *a* are the pivots of the fingers, C.

The inventor states that this contrivance will milk cows about twice as fast as the work can be done by hand, is more convenient, more cleanly, &c. For further information address the patentee, Wm. H. Whitman, Bailey Hollow, Pa., Patented Aug. 26, 1856.

A Manufacturing City.

The *Providence Journal* says:—"The city of Providence, R. I., contains 73 steam engines, and within a hundred rods of the city line 12 or 15 more, that for all practical purposes belong here; 56 jewelry establishments, employing 1,400 hands, and yielding an annual product of $2,771,600; three bleaching and dyeing works, employing 350 hands, and finishing 50,980,000 yards of goods: 22 manufactories of machinery, steam engines, boilers, castings, &c., employing 2,062 hands; 9,450 tuns of coal, 11,095 tuns of pig iron, 9,801 tuns of other iron, and producing annually 33,800 stoves, 900,000 pounds of nails and spikes, 80 steam engines, 220 boilers, 3,584,000 pounds of nuts, &c., and other articles, to the total value of $2,561,000; two screw factories that yield an annual product of $1,086,000; two butt factories that produce $235,000, and a great variety of smaller manufactories, yielding together an annual product of $17,415,840."

Waterproof Emery Paper.

Common emery paper is made by dusting fine emery on paper which has been covered with a coat of glue. When dry it is fit for use. This paper cannot be used to polish articles in water, because the glue is soluble. To prepare emery paper that can be used in water, the paper should be coated with copal varnish which has been dissolved in hot linseed oil, and to which has been added (when cold) some turpentine containing a little india rubber dissolved in it. The paper is first coated with this composition, then the emery dusted on, in the same manner as on glue then it is dipped in a solution of the sulphate of lead, and afterwards dried in a warm place. The reason for dipping this paper in a solution of the sulphate of lead before drying, is to remove stickiness from the varnish. This kind of emery paper, of course, is more expensive to manufacture than the glue paper.

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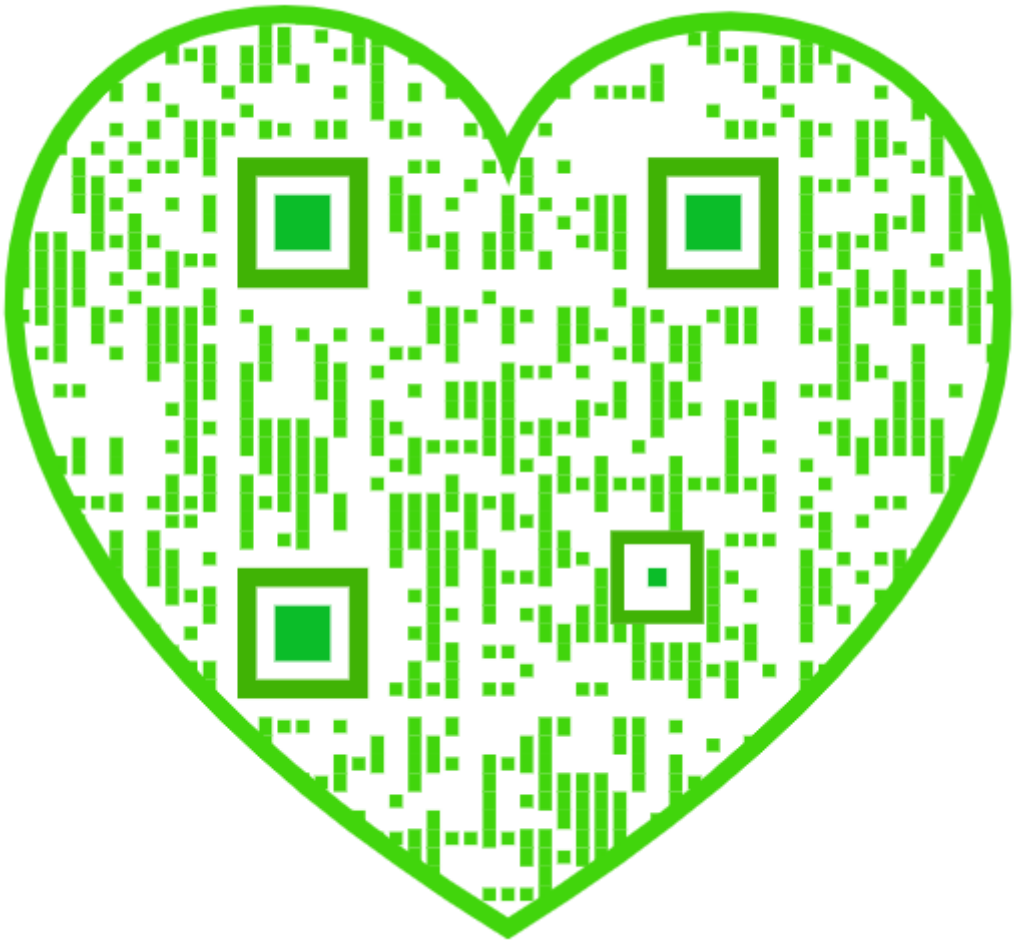

IMPORTANT NOTICE.

When an individual has made an invention, the first inquiry that naturally suggests itself is, *"Can I obtain a Patent?"* A *positive* answer to such questions is only to be had by presenting a formal application for a patent to the government, embracing a petition, and oath, specification, model, two drawings, and the payment of the official fees. Aside from these steps, all that the inventor can do is, to submit his plans to persons experienced in the business of obtaining patents, and solicit their opinions. If they are honorable men, he may confide to them his ideas with perfect safety, and they will inform him whether or not they regard his invention as patentable.

Those who wish to consult with ourselves on such matters, are at liberty so do so, either in person, at our office, or by correspondence through the mails. For such consultations we make *no charge*. We shall be happy, at all times, to examine inventions, and will give conscientious opinions as to their patentability.

Pen and ink sketches of the improvement, and a written description of the same, should be sent. Write plain; do not use pencil or pale ink, and be brief. Remember that all business committed to our care, and all consultations are kept by us secret and strictly confidential.

Parties wishing to apply for patents are informed that they can have the necessary drawings and documents promptly prepared at this office, on the most reasonable terms. It is not necessary for them to go to the expense of a journey in order to be personally present. All the required business can be just as well arranged by correspondence. Models may be sent by Express.

We have been engaged in the business of procuring patents for years, and have probably had more experience than any other firm in the country, owing to the fact that the amount of business done by us equals, if it does not exceed, that of all other professional patent agents in the United States combined. A large proportion of all the patents annually granted by the American government, are prepared and conducted by our firm.—We have in constant employment an able corps of examiners and draughtsmen, whose duties are so systematically arranged, under our own personal supervision, that every case committed to our care, receives the most careful study and attention, and the most prompt dispatch. In every instance we endeavor so to draw up the claims and prepare the whole case, that the patent, if granted, will stand the test of the courts, and be of value to the owner. Patents secured through our agency are scattered all over the country, and in this respect they speak for themselves.

In addition to the advantages which the long experience, great success, promptness and moderate charges of our firm, in obtaining patents, present to inventors, they are informed that all inventions patented through our establishment, are noticed editorially, *at the proper time*, in the SCIENTIFIC AMERICAN, without charge. This we are enabled to do from the fact that, by preparing the case, we become familiar with its peculiarities. Our paper is read by not less than 75,000 persons every week, and has a wide-spread and substantial influence.

Inventors, we believe, will generally promote their own interests by confiding their patent business to our care.

Address MUNN & CO.,
128 Fulton street, New York.

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 28, 1856.

PUPPET VALVE—Robert P. Bradley, of Cuyahoga Falls, Ohio: I do not confine myself to the spiral arrangement of the grooves, b b, up the sides of the valve

But I claim, first, the construction of a puppet valve of the form of a cylinder, of the full size of, or larger than the exterior of the face of the valve, with its face at the bottom, and with grooves in the sides, substantially as described.

Second, when the outlet of the valve chamber is at the side thereof, I claim forming a passage round the valve by making a groove around the interior of the chamber, and a similar groove around the exterior of the valve, to form a passage around the grooved cylindrical puppet valve, to form a passage, f, of an area sufficient for the free escape of water at the outlet of the chamber, substantially as described.

[This invention relates, firstly, to a certain construction of the valve, whereby it is prevented wearing loose in its guide; and secondly, to a certain method of providing for the free escape from the valve chamber of the water or other fluid which passes the valve]

MAKING BRASS KETTLES—Edward C. Blakeslee, Enoch Platt, Jr., and Edmund Jordan, of Waterbury, Conn.: We claim the combination of the revolving female die. A, and its disk or rim, B B, with the male die, E, when these are combined with the adjustable reducing rollers, a a, and the whole is constructed, arranged, and made to produce the result, substantially in the manner and by the means set forth.

LOCKS—William H. Butler, of New York City: I do not confine myself to any precise arrangement of the bolt, b, nor tumblers, or mechanism connected therewith, for the parts shown may be modified in various ways.

I claim placing the case, A, on an arbor or pin, H, which is secured in the jamb or casing of the door, the parts being arranged as shown, or in an equivalent way, so that said case may be secured or locked on the arbor or pin, or allowed to be detached therefrom without he aid of a key, whereby the device may be used as a lock or as a button, as described.

[This invention relates to a new and improved lock, which is designed to serve the purpose of either a lock or button. It is simple in construction, not liable to get out of repair, and may be made at a small cost.]

BENDING SHEET METAL—George W. Burling, of Trenton, N. J.: I claim, first, the combination of the bars. A and E, with the folding bar, B, the same being arranged and operating substantially in the manner and for the purpose set forth.

Second, the loose plates, e and m, in combination with the bars, E A and B.

APPLYING FREEZING MIXTURES TO THE TEETH—Isaac B. Branch, of Galena, Ill.: I claim the employment in instruments for applying cold as an anaethetic of the lip or lips described, substantially as and for the purpose set forth.

Also the combination with said instrument, or the application thereto of the spiral spring, g, and follower, h, or of their equivalent, substantially as and for the purpose set forth.

TOOTH EXTRACTOR—Hazen J. Batchelder, of West Fairlee, Vt.: I claim the described improved dental instrument or combination of forceps, the latching mechanism, the supporting shank and handle applied and arranged together, substantially as specified.

PADDLE WHEELS—Matthew A. Crooker, of New York City: I claim the method of arranging the buckets or floats of a paddle wheel when the buckets are to be broken into sections, that is to say, by arranging each set or section of buckets along four arcs which circumscribe the periphery, and which arcs are struck with a radius greater than the semi-diameter of the wheel, each set of buckets when placed upon the shaft being arranged so that the place where the arcs of the one set meet shall stand opposite to the center of an arc in the adjoining set, if the wheel be composed of but two sections, or when more than two sections shall be divided proportionally.

MOLD CANDLE MACHINES.—Wm. C. Childs, of Boston, Mass.: I claim arranging the wick centering plate, d, in the trough of the candle molds, and on the bottom of said trough, as specified.

I also claim so applying the front board to the bottom board of the trough that said front board may be turned down or removed from the trough, in order that the vertical edge or front part of the surplus fat in the trough may be exposed, for the purpose of facilitating the removal of said surplus fat from the candles.

FASTENING JEWELRY—John B. Coppinger, of New York City; I claim the method of fastening jewelry, &c., substantially as set forth.

CURRENT WHEEL—Plumer Chesley, of Candia, N. H.: I claim, first, the regulators as described and arranged.

Second, I claim the entire arrangement for starting and stopping the wheel, as I have made known.

COOKING STOVES—John W. H. Doubler, of Lena, Stephenson Co., Ill.: I do not claim as new the sliding grate, nor yet the method of elevating or lowering it by means of rack and pinion or equivalent devices.

Neither do I claim the mere use of a draft slide or damper to a stove door.

But I claim the arrangement of the upper stationary doors, A, set back as described, and lower set of doors, B, the latter being attached to the rising and falling grate, and hung and arranged so as to slide upwards over or against the upper doors when elevating the grate to raise or reduce the size of the fire, said lower sliding doors being provided with a damper or slide, m, whereby the same relative position of front draft opening to the fire is maintained, whatever the varied set in altitude of the sliding grate, and whereby, while a large amount of door surface is provided the furnace or stove, but a portion only of the weight of said doors has to be lifted in elevating the sliding grate.

PRESERVING DEAD BODIES—John A. Gaussardia, of Washington, D. C.: I claim injecting the body with a mixture of arsenical pyroligneous acid, and then charging it with a current of electricity, for the purposes described, and then filling the coffin in which the body is placed, and which is afterwards hermetically sealed, with an alcoholic mixture of arsenic, together with the oils of cicuta and caryophylus aromaticus, substantially as described.

GAS GENERATOR—Charles A. Howard, of Pontiac, Mich.: I claim the series of inclined retorts, constructed and arranged substantially as described.

EVAPORATORS FOR SALTS—John R. Hopkins, of Auburn, N. Y.: I claim the apparatus for the evaporation of solutions whose solvent capacities are increased by application of heat, and diminished by cooling, consisting of a close boiler in combination with one or more vats or reservoirs, arranged substantially in the manner described.

HANDLES OF AGRICULTURAL FORKS, SHOVELS AND HOES—Reuben M. Hine, of Throopsville, N. Y.: I do not claim any mode of fastening the handle to the piercing or cutting part of a fork, shovel, or hoe.

Neither do I claim any mode of constructing the head-piece, or of attaching it to the handle; and I disclaim making the handle of any implement whatever of metal, or of an unfilled metallic tube.

But I claim making the handle of an agricultural fork, shovel, hoe, or equivalent implement of a metallic tube filled with wood, as described, whereby the advantage specified is secured.

WATER WHEEL—George E. W. Herbert, of Cohocton, N. Y.: I claim the flanges, I, constructed as described, in combination with the inclined position of the buckets, a, substantially as specified and for the purposes set forth.

SMUT MACHINES—Harvey B. Ingham, of Camptown, Pa. Ante-dated June 24th, 1856: I claim, first, the receptacle, D, arranged and operating in combination with the blast tubes and beating cylinder, substantially as specified.

Second, I claim the arrangement for discharging the grain by its centrifugal action at an aperture on the upper side of the beating cylinder, and through a channel eccentrically around the blast pipe, whereby the grain is thrown into the blast higher in the pipe, and is distributed more evenly therein, as set forth.

WASHING MACHINES—Josiah Mumford & John W. Wilson, of Clarksburg, Ohio: We are aware devices for washing one portion of a garment more than another portion have been used; this we do not claim independent of our special means of accomplishing this object.

But we claim, in combination with a rotating tub having radial ribs on its bottom, a stationary rubbing board also provided with radial ribs and radial slots between them, through which any particular portion of the soiled clothes may be protruded to be washed without washing the entire piece, which lies on top of said rubbing-board, as set forth.

SUSPENSION HOOK AND INSECT INSULATOR—Joseph C. Moulton, of Fitchburg, Mass.: I am aware it is not new to surround a tree, or the foot of a bed post, or a meat safe with a trough or dish for holding a fluid, and therefore I do not claim such.

My invention combines with the insulating cup a screw and a hook, or the equivalent thereof, for the purpose of attaching one article to another, or of so suspending or isolating it as to protect it from insects, as described.

I claim a new or improved article of manufacture composed of a screw rod, cup, and a hook, the hole being arranged and applied together, substantially as specified.

IVORY BLEACHING APPARATUS—John Phyfe, of New York City: I do not claim the exclusion of air from the ivory during the bleaching process, and I do not confine myself to the construction of the apparatus in such a manner as to exclude the air during the process, or to any particular construction of the apparatus.

But I claim the bleaching of ivory by exposure to the rays of the sun on a glass table, with a reflector below it, substantially as described.

[The above invention consists in placing the ivory upon a glass table or bed which is exposed to the direct rays of the sun, and has a reflector below it, to reflect back again the light passing through the ivory, and through the table or bed. The bleaching of the under surface and lower part of the ivory is thus effected by reflected light. By the present method of bleaching it is necessary to turn the pieces of ivory by hand in order to expose their under surfaces to the light, and this operation is quite laborious.]

STOVES AND FURNACES—S. T. Savage, of Albany, N. Y.: I am aware that many stoves and furnaces have been made with a view to economise fuel, by the admission of atmospheric air above or beyond the coal, to inflame the combustible gases evolved from the coal under combustion.

I do not wish to be understood as making claim broadly to the use of an air chamber to supply air to the combustible gases above or beyond the coal or other fuel.

Nor making claim to the combination of a throat or narrow aperture in the flue space supplied with air for the combustion of the inflammable gases.

I claim the use of the throat aperture or passage surrounded by an air chamber and pierced with numerous small holes, through which atmospheric air passes in numerous small jets to the said throat, substantially as described, when the said throat is located between the fire chamber and a flue chamber leading to the exit pipe or chimney, and combined with a perforated plate interposed between the said throat and the fire, substantially as and for the purpose specified.

SEED PLANTERS—Jesse D. Havis, of Perry, Ga.: I claim the vibrating hopper, B, in combination with the pin, g, constructed and arranged substantially in the manner and for the purpose set forth.

HUSKING CORN—Wm. H. Smith, of Newport, R. I.: I claim the combination of the toothed disk wheel, C, elastic endless apron, L, and brush cylinder, A', arranged and operating conjointly, as shown, for the purpose specified.

[This invention consists in the employment or use of a revolving toothed disk, elastic or yielding endless toothed apron, and stripping brush, the above parts being arranged and operating conjointly, so as to strip the husks from the ears in a rapid and perfect manner.]

OIL CANS—James M. Thompson, of Holyoke, Mass.: I do not claim arranging a chamber at or under the bottom of a can, and having a tube to extend therefrom through the oil can and into its spout, the said chamber having an air tube passing transversely into it, or instead thereof, being connected with the oil reservoir and the tube by valve openings provided with valves, as these contrivances or oil cans have had no drip or catching cup or recess to catch the oil which may flow down outside of the discharging spout, whereas my improved oil can is provided with such cup, and it makes an element or part of its combination.

Nor do I claim that combination and arrangement of a catching cup or recess, a chamber and two tubes with the oil reservoir and discharging spout of an oil can, as the whole is explained and represented in letters patent granted to me.

But I claim my described improved arrangement of oil catching cup or recess, e, tube, D, chamber, B, tube, C, reservoir, A, and discharge tube, E, the same being productive of advantages as stated.

PERCH COUPLING FOR CARRIAGES—Wm. S. Lord, of Pulaski, Tenn.: I claim coupling the fore axletree of a carriage or other vehicle to the perch, by means of a cross bar, B, attached to the perch at a suitable distance in rear of the axle, in combination with connecting links, C, arranged and operating substantially as described.

SOAP MIXTURES—George C. Lawrence, of Winchester, Mass.: I claim the combination of the soap compound described, with borax in a pulverized or granular state.

DUMPING WAGON—Wm. B. Twiford, of Horntown, Va.: I claim the so hinging of the reach bars, F F, and the bed, I, to a bent axle, as that when said axle is allowed to turn in one direction in the hubs, the wagon body shall dump, and when turned in the opposite direction be raised up horizontally, without one part being disconnected to slide or run on the other part, as set forth.

SECURING SHEET METAL COVERINGS FOR ROOFS—Wm. H. Trissler & John Stewart, of Fairview, Pa.: We claim the double lapping joint, c, for uniting the sheets of metal without solder, substantially as described.

We also claim the combination of the scroll and wing edges, a b, for uniting the strips of covering, substantially as specified.

WASHING MACHINES—Moses D. Wells, of Morgantown, Va.: I claim the reciprocating clothes rack, guided as described, in combination with the wings, arranged and operating substantially as and for the purposes set forth.

BREECH-LOADING FIRE-ARMS—Thornton A. Washington, U. S. Army: I make no claim to the removal of the breech-piece so as to expose the base of the bore to receive the cartridge, as such construction would be inconsistent with my mode of closing the joint.

Neither do I claim, of itself, a revolving perforated breech.

But I claim the revolving cylinder breech, C, having the funnel passage, F, and the interior flanged cylinder, i, in combination with the chamber, D, and breech seat, arranged and operating substantially as and for the purposes specified.

SHAFT TUGS—Wm. Wentz, of Geneva, N. Y.: I claim the new manufacture of shaft tug described, to wit, a metal shaft tug provided with a buckle for the back strap and a loop for the trace, either with or without a loop for the belly band.

METALLIC PENS—John Wilcox, of Philadelphia, Pa.: I claim the double-pointed pen, in combination with the flanged swivel plate, f, and slide piece, m, constructed, arranged, and operating substantially as and for the purposes set forth.

BACK BAND HOOK FOR PLOW HARNESS—Noah Warlick, of Chambers Co., Ala.: I claim the reverse hook, H, in combination with the guard, G, enclosing the same, constructed, arranged, and operating as and for the purposes specified.

BREECH-LOADING FIRE-ARMS—George W. Morse, of Baton Rouge, La.: I claim inserting the rim, N, or its equivalent, without contact into the chamber, o, substantially in the manner and for the purpose described, contact being attained through the medium of a cartridge case.

I also claim the nippers, S, and the mode of operating them by the pins, r, and the shoulders, 7, on the hammer, or equivalents therefor, substantially in the manner and for the purpose described.

I also claim the combination of movable parts or their equivalents, whereby I retract or deliver the gun of a cartridge, drop it, open and clear the way for the insertion of another cartridge, whether the previous charge was fired or failed to fire, and cock the hammer automatically at one motion, substantially in the manner described.

CARTRIDGES—George W. Morse, of Baton Rouge, La. I claim the combination and arrangement of the cartridge case as constructed, with the priming apparatus as constructed, or their equivalents, whereby I effect the entire exclusion of any, and all escape of the gas produced by the combustion of the powder of the cartridge and priming, except by the one channel and the bore of the barrel of the gun—the breech joints and priming vent being thereby so effectually sealed and closed that no air can escape at these parts of the gun after the charge is fired, until the cartridge case is withdrawn from the bore, although air blown in at the muzzle before firing the charge might escape through these joints, as it would in the case referred to.

R.R. CAR COUPLING—D. Lynahon and C. J. Wing, (assignors to D. Lynahon,) of Buffalo, N. Y.: We claim the construction of the coupling as shown, viz., having the cross bars, C, with pins, D, attached and encompassed by springs, b, the bars and springs being placed in the boxes, B, as described, and the shackles, E, formed with inclined planes, d d, at their ends, for the purpose set forth.

[This invention consists in a peculiar construction of the coupling, whereby the cars may be readily connected and disconnected, and without danger, as there is no occasion for a person to pass between the cars in order to adjust the pins. The device is simple, not liable to get out of repair, and not expensive to manufacture.]

WORKING OVER VULCANIZED INDIA RUBBER—Henry Forstrick, of Hoboken, N. J.: I claim the manner of extracting unorganic matter from vulcanized india rubber, gutta percha, and other gums or their compounds, by the application of diluted nitric acid and the use of fusel oil (grain oil) either in a heated state, mixed with the gum, or in the shape of vapors, for the restoration of the cleansed gums to the state of cohesion.

PROJECTILE FOR ORDNANCE—John B. Read, of Tuscaloosa, Ala.: I claim the attachment to elongated shot or shells of a cylinder of wrought-iron fastened to the body of the shot or shell, by having its bottom or sides more or less imbedded in the cast metal of which the shot may be composed, the cylinder to be attached to the butt of the shot or shell, and its sides to project beyond, being thinned down, after a short bevel, to such a degree as exactly to fit the bore of the gun when the charge is fired, so as to save windage in all cases, and impart rotation when rifle grooves are employed.

BILLIARD TABLE CUSHIONS—Wm. B. Carpenter, of Brooklyn, N. Y.: I distinctly disclaim the use of the metallic spring strip or facing in the construction of billiard cushions.

But I claim the mode described, or its equivalent, of the fastening of the metallic spring strip or facing firmly at or near its entire lower edge, c c, substantially as and for the purposes as described.

RE-ISSUES.

REVERSIBLE HORSE POWER—Philip H. Kells, of Hudson, N. Y. Patented July 8th, 1856: I claim constructing the horse power so that the converge gear may be shifted to and secured upon either end of the main shaft, so that by reversing the pulley and pinion with their shaft, and placing the converge gear upon the proper end of the main shaft the machine may be converted from a right to a left hand one, or vice versa, without removing the main shaft.

HEATING BY GAS—Wm. F. Shaw, of Boston, Mass. Patented Feb. 26th, 1856: I claim the combination and arrangement, substantially as described, of air and gas burners or distributors, chambers, A' and B', and their flue and air supply conductors, F C C, the whole being made to operate essentially as specified.

I also claim, in combination with the gas burner, the perforated or wire gauze tube, g, operating as specified.

HARNESS SADDLES—O. B. North & Co., (assignors—through immediate assignment—of A. H. Gazlay, dec'd.) of New Britain, Conn.: What is claimed in the manner of constructing harness saddles is making the jockey skirts and saddle of metal cast in one piece, substantially as and for the purpose specified.

Reform of the British Patent Laws

Aristocratic though England may be in the form of its government, there are still some points of true democratic nature in her nobles, for which we must give them honorable credit. Thus, for example, great interest has been manifested by some of the greatest nobles in that country for the interests of inventors, and they have placed themselves, in relation to science, on the same platform, and mixed on equal social terms with mechanics and artists.

At the meeting of the British Association for the Advancement of Science, held in Glasgow in 1855, a committee was appointed, on the recommendation of the mechanics, for the purpose of making the British patent system more efficient, and to render the surplus Patent Fund available as rewards for inventors and the advancement of science, instead of being absorbed in the general fund of the government. That committee consisted of the Earl of Harrowby, the Duke of Argyle, Wm. Fairbairn, engineer, Sir David Brewster, optician and philosopher, Col. Sabine, of the Army, T. Graham, Master of the Mint, chemist, and Thomas Webster, Patent Advocate. This committee petitioned the Lord Chancellor, Lord Cranworth, on the subject, and he returned an answer to the effect that he was willing to comply with the memorial whenever the means were fully matured and set forth, whereby the reforms suggested could be carried out.

At the late meeting of the British Scientific Association in Cheltenham, in August last, the same committee was re-appointed to take such steps as were necessary to arrange the best method of rendering the patent system more beneficial to inventors and the cause of science, and we have no doubt but the result will yet be a great reduction of the British patent fees, and a more simple method of securing patents, and all through the efforts of the members belonging to the Association for the Advancement of Science.

From the proceedings of our American Association for the Advancement of Science, held in Albany in August last, no person can learn that such a class of persons as mechanics and inventors exist.

Pettingell's Pistol.

"We understand that a company has been organized with a capital stock of one million dollars, (all of which has been taken) to manufacture "Pettingell's telegraph revolving pistol," a new invention, which combines simplicity, strength and rapidity of execution. It is said to be an extraordinary weapon, and destined to supersede all other revolving pistols, and that it will be adopted by the army and navy.

"It is alleged that this pistol is self-cocking—an important improvement—and that it can be fired six times in a second and a half of time. The hammer is enclosed, and there is no strain on the main spring except at the moment of discharge. There are but seven pieces in the lock, (two less than a market lock,) and these are so simple that a blacksmith can repair them.

"It has received the commendation of some of the most scientific officers of the army and navy. The capital stock of the company is not for sale. The office of the company is at No. 7 Wall st."—*New York Evening Post.*

[One million of dollars is a very large sum to be invested in any new invention, although we believe Mr. P. has a capital improvement in fire-arms. His patent was secured through this office.

Foreign papers state that all the English mechanics are to be dismissed from the Russian service, and Americans to be employed.

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Origin of Mechanics Institutions.

A correspondent of one of our daily papers, writing from Toronto, C. W., states that there is a good Mechanics' Institute in that city, numbering 650 members, and "in its reading room there is a fac simile of Dr. Birchbeck's address on laying the foundation stone of the London Mechanics' Institute, A.D. 1823—the first of its kind."

It affords us pleasure to hear that Toronto has such a prosperous Mechanics' Institute, but if the members have obtained a fac similie of Dr. Birkbeck's (not Birchbeck) address on laying the foundation stone of the London Institute, under the impression that it was the first of its kind, then we must tell them they are much mistaken.

The first institution of the kind was opened in Glasgow in 1796, and founded by money bequeathed by Prof. Anderson, who for years previous to his death gave lectures within the College to mechanics and artisans on chemistry, mechanics, and natural philosophy. Dr. Birkbeck was a lecturer in this institution prior to his removal to London in 1804; his successor was Dr. Ure, author of a number of works on art and science. In July, 1823, a number of members left the Anderson Institute and founded a new Mechanics' Institution, whose first lecturer was Dr. Steele, the originator of the New York Mechanics' Institute. The London Mechanics' Institute was formed in October, 1823, with Dr. Birkbeck as President, who delivered the address referred to on that occasion. At that period there were two such institutions in Glasgow; the first, termed the Andersonian nstitution, is the most perfect and flourishing of its kind in the world; the second is also a good institution, but not equal to the one established in London, we believe, because it has not the same amount of wealth to sustain it.

To Dr. Anderson, of Glasgow, belongs the credit of being the founder and father of Mechanics' Institutes. He was Professor of Natural Philosophy in the college in that city for 40 years, and its doors were opened to admit mechanics and artisans for a very small fee, to attend the lectures. He was a great Republican, and invented that most important arm of warfare, *flying artillery*.

New Tanning Process.

Although a great number of patents have been taken out for tanning processes, both at home and abroad—more than a hundred having been granted—new modes are still being patented and brought before the public.

We learn by the London *Mechanic's Magazine* that an important improvement in the tanning of skins and hides has recently been introduced into that country by M. Funcke, a practical tanner and currier, of Herdecke, Wesphalia. It consists in counteracting a too rapid action of the tannic acid upon the surface of the skins. The mode of operation is as follows:—

The unhaired skins or hides are first passed through a weak liquor of the soda of commerce, then hung up to dry. They are then steeped in a common oak, hemlock, or other tanning liquor of the common strength, to which has been added some vinegar. In this liquor the pores of the skins are opened, and thus the tannic acid is admitted to the interior The next tannic liquor in which the skins are steeped is made a little stronger with the bark, also some more vinegar, and a little dissolved sugar is added. The succeeding liquors to which the hides are subjected, until they are finished, do not differ from those in common use. The vinegar being a vegetable acid, unites with the alkali of the soda in the hides, and its carbonic acid is set free in the pores of the skin; this expands them, and allows the tannin admission to the center of the hides in the first tanning liquor. The sugar in the second tannin liquor, unites with the vinegar, and forms a tannin mixture, it is said, which is of a softening character, imparting elasticity to the leather. The strength of the soda lye used to steep the hides in the first stage, is not above 1°—very weak—and a very small quantity of vinegar is sufficient for the purpose stated. Any other vegetable acid may be used in place of the vinegar, but it is the cheapest.

The expanding of the pores of hides and skins by generating a gas in the tanning liquor by the agency of the carbonate of soda and an acid, such as sulphuric and muriatic, is not new. It has been tried in this country, and is known by the name of the "Hibbard process," but it has not displaced the old methods, and never will. The process of M. Funcke is the same in its nature as that of M. Claussen for splitting the fibers of flax, to produce flax cotton, and which, we think, unless performed with great care, will injure the hides and skins, by tending to separate their fibers, and thus produce more weak, although it may be more thorough and quicker tanned leather. The use of vegetable acids in tanning is certainly more safe than mineral acids.

It is, certainly, an object of importance to prevent the too rapid tanning of hides at the surface, and every process of quick tanning is liable to this evil, by the early closing of the pores, thus preventing the interior of hides from being tanned.

(For the Scientific American.)

Auricles for the Deaf.

My attention has been called to an article in the SCIENTIFIC AMERICAN, of August 9th, on the subject of Artificial Ears, which I desire to notice, not for the purpose of calling in question Dr. Byford's views, resulting from his experiments, but to make known to all who are afflicted, and those interested for them, the actual results of my own experiments with the instruments which you kindly allude to in your editorial comment on Dr. Byford's letter.

I have for some time been aware of the various improvements made, in affording relief to the deaf, and early became convinced that they were, in general, extremely defective. The objections were always so prominent, that they seemed rather to repel than invite the unfortunate to use them. First, there is the india rubber tube, with the mouth-piece, carried like a snake coiled around one's hand—the offensive mouth-piece used indiscriminately. Then there was the trumpet to be carried about, compelling, as with the tube, the concentrated energy of the unfortunate brain on one ear. Then we had gutta percha ear fittings, that were too inefficient to impart vibration, and be heard at short distances—having the advantage of the others, by reason of not requiring to be supported by hand, but that was all.

With these radical objections to overcome, I began with the main idea of first securing a strong vibrative power—a power that *must* make an impression, and thus enable the auricular nerves to hear what was addressed to them, and without any special effort of the wearer—that could be worn so as hardly to be felt, and what was of more importance, comely in appearance—that no matter how powerful such vibration might become, it could be controlled and subjected to the various degrees of deafness required.

This was my programme. I avoided india rubber, gutta percha, and all substances not good as acoustic reflectors, and provided prepared metal plates of three varieties for each instrument, and hitting on that peculiar form and bend of a graduated tube, A, as you see in the accompanying engraving, by which the ear is scarcely touched, and the concave sweep of it inside, B, fitting the head and causing it to be so supported, when adjusted, that no outside pressure can force the tube further than needed. C are small tubes that fit the ear; D are springs connecting the two auricles; the springs slide to suit different heads.

E is a perforated drum or partition intersecting the channel of vibration. By increasing or diminishing the size of the aperture of E, the power of the vibrating sound is controlled to suit the degree of deafness of the wearer.

Since the inauguration of my instruments, I have been reluctant to claim from the public any more attention than an occasional advertisement, which has called out an extent of correspondence that is truly astonishing.—Those who call on me and get fitted, invariably have the story to tell of their many neighbors afflicted in the same manner—with the mournful tale of long and expensive efforts undergone to obtain medical relief—that never succeeded.

I add that the instruments will furnish capital puffs for a lady's toilet; as long as the present fashion exists, deaf ladies could not desire anything more appropriate, as the whole is not affected by being entirely covered.

I ought to remark, in conclusion, that the effect of the circuit, occasioned by the connection of the auricles with each other, by the band, D, passing over the head, is instantaneous, reminding one of the magnetic circuit in telegraph batteries. E. G. HYDE.

[See the inventor's advertisement in another column.

Harmony of Revelation and Science.

During the past few years much discussion has been elicited in regard to the teachings of geology and their bearing on Revelation.—Some have asserted that the views of geologists respecting the age of the world, and the succession of organic creations, contradict the Scriptures, while others assert the contrary.

The question is one of deep interest, and has engaged, and is now engaging the attention of many men eminent for scholastic and scientific attainments. Various works have been written, *pro* and *con*, on the subject, and numerous controversial papers given to the world through the columns of certain periodicals.

Prof. Taylor Lewis, of Union College, distinguished for his biblical learning, and Prof. Dana, of Yale College, so eminent for his scientific knowledge and ability, have had a discussion in recent numbers of the *Bibliotheca Sacra*, and the question does not seem to be considered exhausted, for Prof. Barrows, of Andover, has gone into it again in the last number of this able review.

In our opinion the question has been brought to a point at which it may truly be said, "argument is exhausted, and further discussion worse than useless." Our reasons for these opinions will be given in a few words.

The Sciriptures and the science of geology teach us that this earth was at one period in a state or condition without a living thing upon it—no plant, no flower, no insect, bird, beast, or man. Both teach us that the successive acts of creation described in the first book of Genesis are in exact accordance with the revelations of the book of nature. There is no difference of opinion between the teachings of Revelation and Science on these points.

One class believe that the *days* mentioned in the first chamber of Genesis mean epochs of time, and may be so interpreted, and thus accord with the teachings of geology; the other class believe that the *days* referred to cannot be so interpreted; that they mean solar days; and thus they assert that this science as generally taught, is contradictory to Revelation. Thus the main question stands, but not involving, we conceive, the least contradiction between science and revelation, for the question of controversy is one only relating to TIME.

Moses, who certainly was ignorant of geology, has described the successive acts of creation in that specific order which accords with the science of geology. It is reasonable to suppose that an ignorant man, in describing the order of nature, as unfolded by the successive fiats of the great Jehovah, would have presented only a confused and contradictory effusion; but instead of the first chapter of history being of this character, it vibrates in unison with the discoveries of the most modern science, thus proving that the pen of its author was directed by the Author of Creation. The question of the harmony of revelation and science, as it relates to the "orders of creation," stands upon a grand and impregnable basis.

Benefits of Machinery.—Mechanical Engineers.

A great meeting of Mechanical Engineers was recently held in Glasgow, and Mr. Joseph Whitworth, of Manchester, (who was Commissioner to our World's Fair in 1853) President, delivered an appropriate introductory address. He referred with approbation to the new process for the manufacture of iron; and as an illustration of the value of the invention, mentioned that when employed in making rifle balls for the Government, one of the greatest difficulties with which he had to contend in endeavoring to secure accuracy of flight was defects in the composition of the iron itself. He next referred to the importance of securing greater nicety of measurement, and directed attention to a machine he had invented, by means of which the one millionth part of an inch could be measured. He advocated the decimalizing of weights and measures, deprecating the carriage duty as a tax on mechanical industry, and concluded by making a comparison of the extent of the industrial production of the country at the present time with what it was at the period when hand labor was more employed. As one of the most striking contrasts which occurred to him, he mentioned that in the article of lace, one man with a machine could turn out as much work as at one time would have employed 8000 operatives; and the chipping and planing of a square foot of cast-iron, which once cost 12s., was now accomplished by machine labor at a cost of 1d. And not the least benefit of the general introduction of machinery were the larger wages earned by the operative under the improved system.

Messrs. Craig & Righter, of Newport, Ky., have contracted with the Engineering Bureau of the War Department to keep the South-West Pass and the Outer Pass, of the Mississippi River, open to a depth of 20 feet and width of 100 yards, for five years, for the sum of $330,000.

Useless Inflated Life Preservers.

During the great gale on Long Island Sound on the night of the 16th ult., when the steamboat *Connecticut* came near being lost, it was found that most of the flexible inflated life-preservers were totally useless. The Steamboat Inspectors condemned the use of such life-preservers at their annual meeting last year, and yet they continue to be kept on board of some steamboats as a hypocritical fulfilment of the new Steamboat Law.

The U. S. Astronomer.

The Boston *Traveller* states that George P. Bond, first assistant at the Astronomical Observatory of Harvard University, has declined the appointment recently tendered him by the President of the United States, of Chief Astronomer, under the act of Congress of August 11th, 1856, to carry into effect, the first article of the treaty of June 10th, 1846, between the United States and Great Britain, by running the boundary line between the United States and British Oregon. The appointment was made without any previous consultation with Mr. Bond.

Removing Incrustations from Culinary Vessels

MESSRS. EDITORS—In answer to A. J. B., of Mass., in No. 3, in relation to removing incrustations from culinary vessels, if he will boil a few potatoes in such vessels they will produce the desired effect. This is the method used here in the West, where we have none but hard water. I. A. HOXIE.

Cooksville, Wis., Oct., 1856

Present to an American Inventor.

Louis Napoleon has presented Jos. Francis of this city, with a gold snuff-box, as a mark of satisfaction, after witnessing some experiments with his life boats and military wagons.

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New Inventions.

New Brick Machine.

In the apparatus represented in the accompanying engraving, fig. 1 is a plan of the machine, fig. 2 a side elevation, fig. 3 an inverted plan of the flue table or bed detached, fig. 4 a plan of the mold box, and an inverted plan or under horizontal view of the pressing plate detached, and fig. 5 a vertical transverse section of the mold box and pressing plate.

A circular bed, A, of large diameter, is seated horizontally upon a foundation surface or table, B. A crane, C, is erected centrally within the circular bed, and hung so that its jib may be made to perform a circular horizontal travel over the said bed. An inner and outer row or circle of vertical guides, *a* and *b*, are inserted in the bed so as to form a step or shoulder midway of their length; the arrangement of these guides around the bed is such, that upon a radial line being drawn from the center of the crane post centrally between any two of the inner row of guides, *b*, the width or distance apart of the two outer guides, *a*, intersected by an extension of the said radial line will be the same as the width or distance between the two specified inner guides, *b*, thereby forming a succession or series of quadrangular sets of vertical guides for the reception over or on them of a quadrangular mold box, D, pressing plate or platen, E, and cover, F, as represented in fig. 1.

The mold box, D, is formed of vertical rectangular sides, united by partitions or cross ties that divide the box into five hundred (more or less) molds S, open top and bottom, the upper surface of the circular bed, A, serving as the bottom to the molds, when the box is situated as in fig. 1, when it is ready for filling with clay, which may be deposited by hand or otherwise into the molds; a platen, E, is then brought to bear down upon the clay in the molds, as represented in figs. 1 and 5; this platen is formed of a top plate with under projecting pressers, *c*, that fit into the molds, and, by their weight, and that of the top plate, as also by any loose additional weight that may be put thereon, serve to compress the clay to the required dimensions of the brick. The platen is lifted to its situation over the mold box by a hook, *d*, attached to the main chain or cord of the crane, and hitching into a loop, *e*, on the top plate of the platen, the crane chain being raised or lowered as required by turning the winch, *f*. The perforations through the snugs of the mold box, *a'*, are of the requisite diameter to admit of the box being dropped over the enlarged lower portions of the vertical guides, *a* and *b*, while the holes through the snugs of the platen are of the same diameter as the upper portion of the said guides, so that the shoulders formed at the junction of the large and small diameters of the guides will serve to arrest the motion of the platen when it has been lowered sufficiently to compress the clay to the required extent, by which arrangement a uniform size of brick is insured. This size may be regulated at pleasure by inserting washers over the smaller portions of the guides, to rest upon the shoulders thereof, so as to reduce the depth of the pressers into the molds.

When one set of bricks is thus formed, the crane chain is unhitched from the platen, and hitched to the mold box by branch hooks and chains, *h*, united to the main chain, and connecting with the mold box by loops, *i*; the winch is then turned so as to lift the mold box from the bricks and leave them on the circular bed, A, as represented at X X in fig. 1, the mold box in rising carrying the platen with it. The mold box and platen thus free from the molded bricks are then swung over the next series or sets of vertical guides by turning the crane, and the mold box being dropped over the guides is again filled with clay; the crane hooks being unhitched from the box, and the platen raised to afford room for putting in the clay, when the platen is again brought to bear down upon the clay in the molds as before, and the box and platen afterwards removed to the next series of vertical guides, and so in succession until the circular bed is covered with bricks.

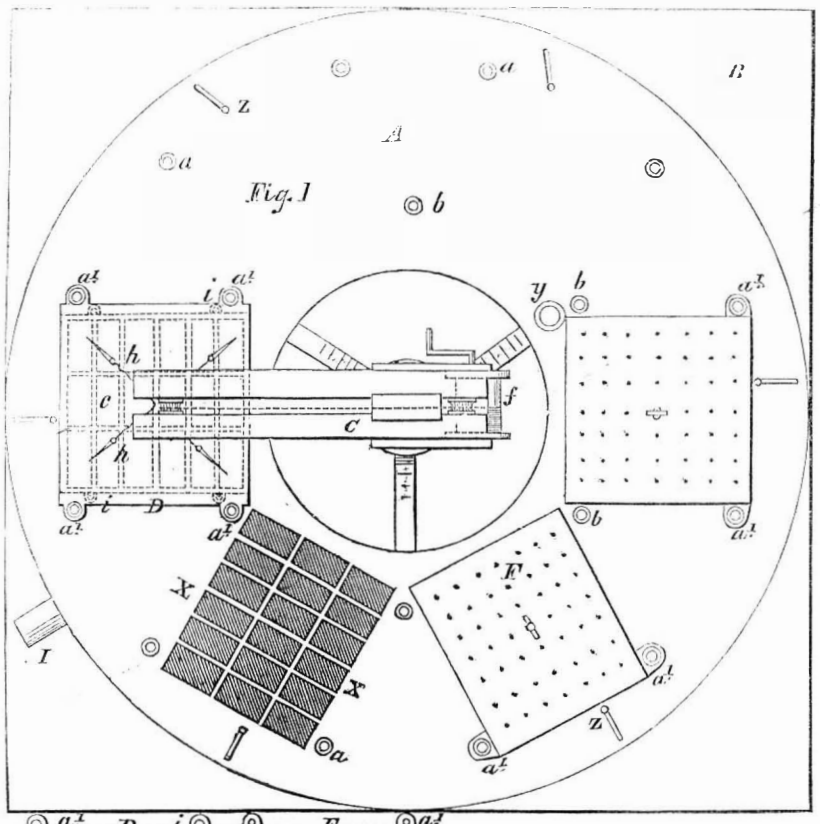
To give a gradual pressure on the clay in the molds for the purpose of expelling moisture and increasing the consistency of the brick, the winch barrel is turned but slowly during the early part of the depression of the platen and quicker towards the close; a sounder brick will thus be produced, while the most complete adjustability in the operation of the platen throughout its entire stroke is afforded.

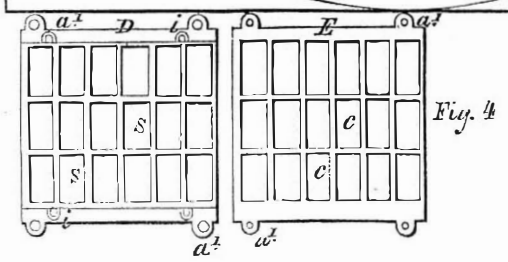
The circular bed, A, is made hollow, and has flues in it for circulating hot air, for the purpose of drying the brick on the bed on which it is pressed or molded. These flues consist of an outer annular induction and inner annular eduction flue, with radial direct and return flues uniting them, the radial flues being so arranged as to pass the current of hot air immediately under the several tiers or rows of bricks, the circular bed only intervening. Hot air is blown through a pipe, I, into the outer annular induction flue, *m*, from whence it passes through throats, *n*, into direct radial flues, *o*, it is then diverted so as to return by other adjoining radial flues, *r*, and again through further radial flues, *r'*, direct to the eduction flue, *u*, from whence it escapes by a pipe, *y*; the throats, *n*, forming the communication of the induction flue with the radial flues are provided with dampers, *z*, that serve to regulate the amount of hot air to be admitted, and also to shut off the flow of hot air through any one or more of the sets of radial flues over which no range of bricks is situated either during the operation of covering the bed with its several ranges of bricks or during the removal of any of the ranges to the kiln. The return radial flues, it will be observed, serve to heat equally the several rows of each range of bricks, and any number of direct and return flues may be arranged to circulate the hot air according to the number of rows in each range.

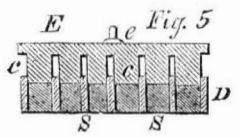
After the bricks are molded, and during the time they remain on the circular bed to dry, each range of bricks should be covered with a bonnet to retain the heat. Perforations are made in the tops of the bonnets, to permit the escape of the vapor which is emitted during the process of drying.

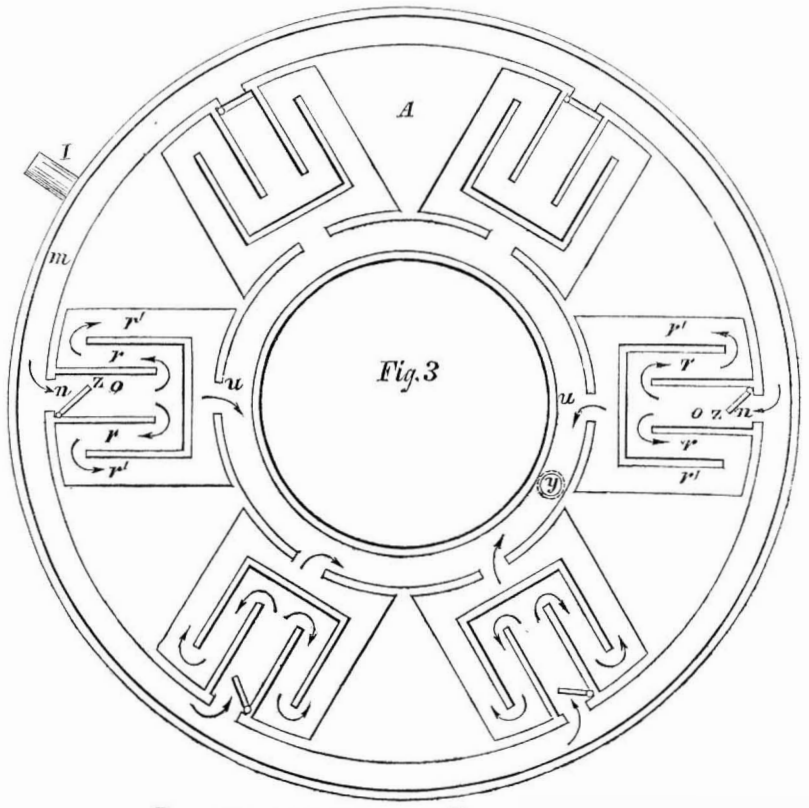
By this method of making bricks the various well-known facilities and advantages of the ordinary manual process are combined with those of the machine or press system, while many disadvantages peculiar to the action generally of the latter are avoided. The bricks are made rapidly, dried, and prepared for the kiln upon the bed on which they are molded with but little delay, and without the labor of removal or exposure to defacement to which they are subjected in the ordinary way. This machine is capable of manufacturing tile, hollow cornice, or any of the other well-known forms of brick. For further information address the inventor, Prof. John C. fr. Salomon, Jr., No. 50 Lee st., Baltimore Md. Patented April 25th, 1854.

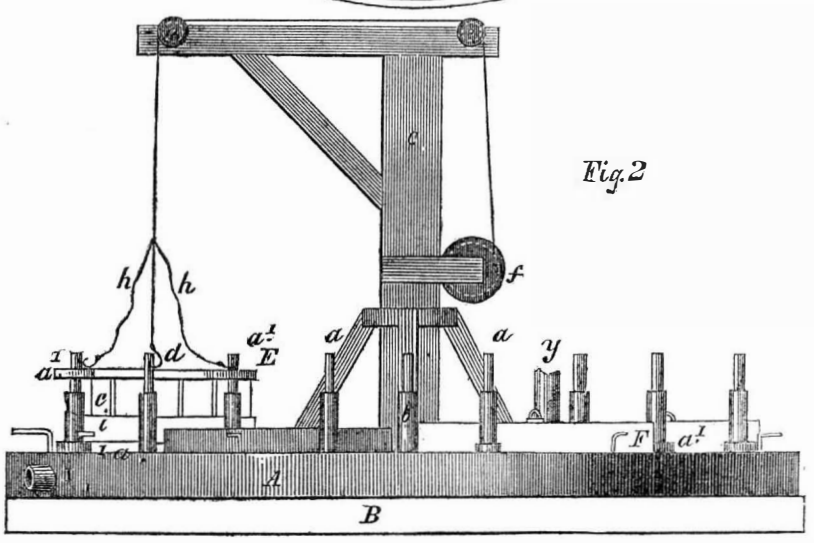
NEW BRICK MACHINE.











Berdan's Mechanical Bakery.

A bakery upon an extensive scale has been commenced at Central Hall, Brooklyn, N. Y., by H. Berdan, Esq., in which the various manipulations are all performed by new and improved machinery. The cut dough is carried into a vertical oven on trucks, and on an endless platform is carried down, baking gradually as it is moved along, and is discharged in well baked loaves at the lower end. The bread baked in this manner is superior in quality, and the loaves are larger, for the same price, than those generally sold in our city.—The machine was invented by Mr. Berdan with the object in view of economizing labor and producing good bread, and he has succeeded far beyond his expectations.

SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the Scientific American will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

For the largest List,	$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st o January, 1857.

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Scientific American.

NEW YORK, NOVEMBER, 8, 1856.

Inventors' Congress.—Great Enthusiasm!—Six Members in Council!!

An adjourned congress of inventors and authors (so called) was held at the Crystal Palace on the forenoon of the 28th ult., for the purpose of adopting a constitution for a confederation of inventors and authors, to be composed of STATE COUNCILS, and a Grand National Council—the latter to have its headquarters and its executive officers, and to hold its minor sessions and annual congress in this city.

Clinton Roosevelt acted the part of President of this ponderous body; a constitution was adopted, and a declaration of principles put forth. One object of this movement was stated to be the formation of a party having political weight, to carry out certain particu lar measures, such as reforming the patent laws, &c.

Such an association is, in its design, an impracticable piece of fogyism, totally useless and inefficient to do anything but evil to inventors. We have too many political parties inflicting our country already, without addng an inventors and authors' party to the list. Such a party would be one of *caste* and class, and would justly excite the jealousy of other classes. As well might mechanics, manufacturers, lawyers, and merchants, soldiers and sailors form parties on the same *caste* principles, and organize themselves into political clubs and conclaves. Such a party and such associations of persons are generally subversive of honest legislation, and we know they will be repudiated by all intelligent inventors and authors—*they* do not want to be considered a one-sided class different from the people, but of and belonging to the people.

If any necessary reform of the patent laws is wanted, such a party would tend to defeat this object, and thus inflict injury upon inventors, who require the good will, the influence, and the political weight of the people to get a redress of grievances. An exclusive inventors organization would lead the public to suspect them of seeking exclusive privileges, and thus defeat the very objects they had in view, even if they were commendable and just.

As it is intended by those interested here in this movement to send circulars to inventors throughout the different States, inviting them to contribute and cooperate in the formation of this party, we advise inventors not to be deceived as to the numbers and influence of those who have originated the scheme. We attended the meeting, and it was composed of exactly six persons.

It excited no interest whatever among our respectable inventors who did not attend it, none of them having the least confidence in the practical wisdom of its founders or the necessity for such an institution.

As notices of this affair have appeared in various papers, magnifying its importance, the public can judge whether the astonishing number of *six* persons, in such a city as New York, entitles such a meeting to the appellation of a "Congress of Inventors." Why the thing is a perfect mockery—a great mountain and a very small mouse.

Automatic Whistle.—Safety on Railroads.

Every improvement that gives security and safety, on railroads, should be fostered and encouraged. Of the many accidents that occur on railroads, nearly all are the result of the want of proper care and management on the part of the operatives.

The engineer of a train has the greatest responsibility and the most delicate duties to perform. He is subjected to certain rules and regulations, issued by the executive officers of the company. With those rules and regulations he must be perfectly conversant, and they not only refer to his own train, but they relate to all other trains on the road. Every motion of his engine must be constantly watched while it is in operation; he must know by personal inspection that his machinery is all right; he must regulate his quantity of steam, and have a watchful eye on his assistant and fireman; he must regulate his speed by the changing and varying grades of the road; every mile, yes, every foot of track must be carefully scrutinized; every switch must be seen by him to be correct, and at a long distance ahead of his rushing train; he must warn all persons on the railroad crossings that his train is approaching, and the same must be done at all stations. All these and many more duties must be performed by him with a clock-work regularity and correctness.

Knowing these great and varied duties of our locomotive engineers, it is not surprising that many accidents should occur from the neglect of some of them; the wonder is with our exposed railroads, that more do not take place. Every invention which has for its object the positive execution of a single duty, to relieve the engineer, must certainly add to the safety of railroad traveling, and this is peculiarly the case, with operating the steam whistle, which requires to be sounded so very often.

There is a State law compelling an engineer to blow his whistle at all crossings and while approaching all depots, day or night. This duty is frequently neglected at the proper time and place, from the pressure of other duties, from darkness, and perhaps from inattention, and serious consequences are the results. But a remedy has been provided in the Automatic Whistle of Jas. Harrison, Jr., of the Union Works, corner 22nd street and Second Avenue, of this city, and described on page 245, Vol. 11, SCIENTIFIC AMERICAN.

It has been applied to the locomotive *Fordham*—running on the Harlem Railroad, and has operated with unerring certainty, and in no instance, failed to give the proper alarm according to the testimony of the Master Machinist, M. P. Miller. A short time since a party composed of several members of the press, in this city, superintendents of railroads and others, were invited to witness its operations on the *Fordham*, in running to Croton Falls (51 miles) and back. From New York to Croton Falls, and back, there are 104 crossings and depots, or points where the engineer should and must sound his whistle. Previous to starting the whistle, it had been "set" to alarm at all these stations or crossings, and it did not fail to give the warning at the very bar and tie for which it had been adjusted.

Being a part of the engine, it requires no effort on the part of the engineer to operate, and is entirely independent of him. When once adjusted, it must continue so for the whole time the engine is run upon the road. We see no reason why it should not be brought into general use, upon all railroads, as an unquestionable means of safety. It is simple in construction and not expensive in its application to locomotives, and we commend it to the attention of railroad men to investigate.

New Spring Saddle.

Fig. 1

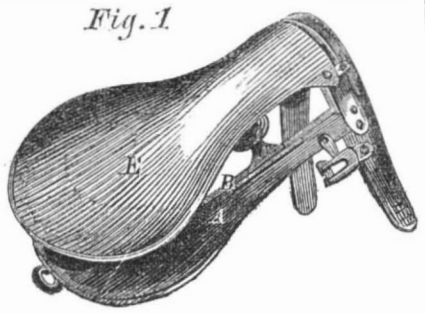
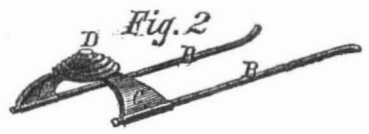


Fig. 2



By Prof. John C. F. Salomon and Geo. E. Cooper, of Baltimore, Md.—Consists in providing the saddle tree with a spring, which relieves the rider from the effects of rough jolts, and renders horseback riding much more comfortable than it is, when the ordinary saddle is used.

In our cut, A, is the saddle-tree and B a frame, secured on the edge of A. C is a spring chair extending across the saddle-tree, and furnished, in its center with a volute spring, D, said spring and chair rest and slide on frame B, and may be moved back and forth upon it at pleasure. The seat, E, is made of metal, and may be covered with any suitable material. No bolstering or strapping is required. Patented July 22, 1856. For further information address the patentees as above.

Great Exhibition of the American Institute at the Crystal Palace, New York.

SIXTH WEEK CONTINUED.

Close of the Exhibition.

Want of space, last week, prevented us from closing up our reports of the Exhibition, which terminated, as announced on the 25th ult. On the 28th the regular closing Address was delivered at the Broadway Tabernacle, by Prof. Bache, of the U. S. Coast Survey. A large audience of ladies and gentlemen were in attendance. It has heretofore been customary to announce the awards of premiums at these annual meetings, but it was omitted on this occasion, and even at the hour of going to press the premiums had not been made public.

The examinations by the judges, this year, were conducted in a better and more careful manner than in times past. It has been usual for the judges to appoint a day, or an hour, when they would meet the exhibitor to examine his article and receive from him a personal explanation of its merits. Thus the exhibitor, cocked and primed beforehand, would often succeed in procuring an award to which, in strict justice, he was not entitled. These circumstances, combined with a general laxity, or want of system, in making the awards, have always been the cause of dissatisfaction.

The managers, we learn, desirous of preventing such abuses this year, caused the examinations to be made, for the most part, in secret. The judges passed around as spectators, and made their observations unknown to the exhibitors. This was a good method.

The premiums are now undergoing digestion. They will shortly be announced. We shall then see whether favoritism or impartiality, has ruled in the councils of the Institute,—whether bed-quilts and confectionery, toys and toupees, have, as formerly, overridden genius and science.

Meeting of the Exhibitors.

On the 27th ult. a large and enthusiastic meeting of exhibitors was held in the Palace for the purpose of expressing their opinions in relation to its management. Resolutions of thanks to the officers and Managers were unanimously adopted. These expressed gratitude for the liberal accommodation afforded, and the great attention exhibitors had received. The utmost courtesy was shown to them; every wish met with a response, and every want was promptly supplied. All the exhibitors appeared highly gratified with the manner they had been treated, and it was generally acknowledged that it was the best managed Industrial Fair ever held in this city.

The Annual Address.

Prof. Bache, as stated, delivered the Annual Address on the 28th. His subject related to the benefits of education, science, and invention, and contained some brilliant passages. He alluded to the rapid growth of everything in our country—the march of improvement in science and art—and how from very small beginnings the American Institute was now able to fill with articles for exhibition such a large building as the Crystal Palace. He did not specifically dwell upon certain machines exhibited, nor did he endorse the sublime opinions of Judge Meigs in his Opening Address, namely, that the steam engine was about to be surpassed by the new and wonderful power of electro-magnetism displayed in the electric machines on exhibition, which, alas for the scientific and practical acumen of the Judge, remained during the Fair like gaunt, and grieved spectators of their own insolvency.

Prof. B. touched upon the subject of weights and measures, and hoped the day would soon come when there would be a universal system adopted. He contended for a speedy reform of our weights and measures, advocating one unit of weight, one unit of line measure, and one unit of cubic measure. He spoke of the conduct of Le Verrier, the French astronomer, who recently has put forth as something new, and his own discovery, the method of determining longitudes by the electric telegraph, which has been practiced in the United States for eight years. How different was the spirit of the Astronomer Royal of England—Prof. Airy—who has given this invention the title of "the American Method of Observation."

The address occupied about two hours in its delivery, and if Prof. Bache could have had more time to condense his matter, and to have made it one-half shorter, it would have been much better.

We conclude our notices of articles on exhibition as follows:—

Vergnes' Electro-Magnetic Engine.

An Electro-magnetic Engine is composed of a series of electro-magnets, the circuits of which are broken alternately as they revolve; the current being generated by a battery. On page 184, Vol. 9, SCIENTIFIC AMERICAN, we illustrated the Electro-magnetic Engine of Prof. Vergnes, of this city, for which he received a patent on the 15th of April last; and a very large engine of this character was early put on exhibition. High hopes were excited respecting its operations, but owing to some defect—some break in its complex and intricate conductors—it failed to operate with satisfaction at any time, and stood motionless during the Fair.

The Magneto-Electric Engine.—This machine is entirely different in its nature from the Electro-magnet Engine; the latter is operated by a current generated in a battery; this one is driven by another power (mechanical) and generates a current in itself from permanent magnets and helices, placed near to one another, and revolved in close proximity to their poles. If a piece of insulated copper wire is wrapped spirally around a piece of soft iron, the ends of which are allowed to project beyond the coil, the ends of which are brought near to one another, and if this helice is revolved very close to the poles of a powerful permanent magnet, a current of electricity will be generated and pass along the wires of the coil. This is the simple magneto-electric engine of Saxton. If several helices and magnets are fitted up in a machine, and thus operated, a very powerful current is generated by conducting the several currents of the magnets into one main current. This is the character of Edward Shephard's engine on exhibition. He obtained a patent on the 19th Aug. last, for some devices in its construction, but Dr. Page is the first person who made such an engine (condensing the currents into one) in 1838. Water can be decomposed by such a current, and electroplating has been performed by such machines.

This machine was operated very seldom during the Fair, and public expectation was disappointed by both of these engines.

Carriage Springs.

D. M. Grant, 239 Broadway, New York, exhibits vehicles furnished with *Murgatroyd's* patent springs. Their elasticity is greater than ordinary springs: they are cheaper, it is said, only half the usual quantity of steel being used; they permit the vehicle to be made one-third lighter, render it more durable and much more easy for both passenger and horse. A practical trial of a vehicle fitted with these springs, satisfies us that the improvement is a valuable one.

Oscillating Engines.

Tousley & Reed, of this city, exhibit one of their patent Oscillating Engines, with boiler combined. The compactness and simplicity of this invention form noticeable features. The steam fire engine of Lee & Learned, which took the prize at the late test trial, at the Crystal Palace, is driven by Tousley & Reed's engines.

Booth & Canfield exhibit a Governor Cut-off Oscillating Engine, which is simple and said to work well.

Atmospheric Forge and Trip Hammer.

Ezra Jones, of Rochester, N. Y., exhibits Hughes' patent Trip Hammer. It is simple, compact, and the force of its blows are regulated with great precision, at the will of the operator. See engraving and description in the SCIENTIFIC AMERICAN, Vol. 10, page 65.

Water Filter.

James H. Wright, of this city, exhibits his newly patented water filter, for family use, and other purposes. The case of the filter is divided into two chambers, from one of which the filtered water issues. The other chamber gives a more rapid supply, but the water is

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unfiltered. This is a very simple, cheap, and thorough filter. For engraving and description, see SCIENTIFIC AMERICAN, Volume 11, page 373.

Breech-Loading Fire-Arms.

Frederick D. Newbury, of Albany, N. Y., exhibits specimens of his improved breech-loading fire-arms. The method of loading and firing is strikingly simple and effective. It is one of the best improvements that we have seen. We are preparing an engraving which will shortly appear with full description.

Printing Presses.

S. P. Ruggles, of Boston, Mass., exhibits several of his patented printing presses in operation. Their movements attracted great attention. Mr. Ruggles' inventions are noted for their simplicity, compactness, and effectiveness.

C. Potter, New York, exhibits Davis' new oscillating power printing presses. The types are placed upon a flat oscillating bed, and the impression is produced by a circular, oscillating platen, located above the bed, and acting in concert with it. Both the platen and bed have a pendulum-like motion. The movements are all simple and easy. The inking arrangements are excellent. No springs are used. The press is evidently one of great strength and durability. The work which we saw it execute was well done. Price $700 for folio post or smallest size. The prices are about 25 per cent. less than cylinder presses.

Pumps.

The Ames Manufacturing Co., Chicopee, Mass., exhibit Ball's Patent Safety Pump, for steam boilers. The construction is such that when the water in the boiler falls below a certain line, the steam rushes through a tube, into a pair of cylinders of an oscillating engine, causing it to operate and throw water into the boiler.

Wm. Burdon, Brooklyn, N. Y., exhibits in operation a number of his improved steam pumps, for feeding boilers, and other purposes. They possess the merit of compactness, simplicity, and effectiveness.

Fletcher & Durkee, Williamsburgh, N. Y., exhibit their newly patented steam pump. It is so arranged that it may also be driven by hand, if desirable.

Taylor, Campbell & Co., Brooklyn, N. Y., exhibit a good steam pump and fire engine.

Blake, Wheelock & Co., of New York, exhibit a well made, substantial steam pump.

C. & G. M. Woodward exhibit an improved safety steam pump. Price $100 and upwards.

Carey's Patent Rotary Pump New York, is notable for the ease and regularity of its movements, and the large and steady volume of water which it delivers. For an engraving and description see SCIENTIFIC AMERICAN, Vol. 3. Price $35 and upwards, according to size.

Downs & Co., Seneca Falls, N. Y., exhibit specimens of De Yampert's patent Double-Acting Pump. Two pistons, connected on the inside of the pump, by means of cross levers, are simultaneously operated in different directions, by one piston rod. Four pistons can be operated, on the same principle, by one piston rod, if desirable. It is a singular construction, but works well. For a full description and engraving see SCIENTIFIC AMERICAN, Vol. XI., page 28.

Butcher & Reed, New York City, exhibit some improved double action force and lift pumps.

Joseph Smart, Philadelphia, Pa., exhibits several double-action force pumps, of improved construction.

Lindsey's Patent Pump, is exhibited by J. M. Edney, 56 John street, New York. A pair of pump barrels and pistons are attached to a hollow pipe, and placed in the well below the surface of the water. The pipe extends up to the surface of the ground, where it is rotated by a crank. The ends of the pistons below strike against a cam-shaped ring, and thus receive a reciprocating motion, by which the water is forced up the hollow pipe. For an engraving and description see SCIENTIFIC AMERICAN, Vol. 11, page 310.

Carpenter's Patent Rotary Pump, is exhibited by *Wakeley & Tenney*, Madison, Wis. The internal arrangements are quite simple, and the delivery of water good. For engraving and description see SCIENTIFIC AMERICAN, Vol. 11, page 244.

W. D. Andrews, of this city, exhibits a new centrifugal pump, which throws a very large quantity of water, and works extremely well.

L. P. & W. F. Dodge, Newburgh, N. Y., exhibit their patent pumps. Price $15 and upward.

E. G. Day & Co., New York, exhibit their double-action, anti-friction force pumps, which are alledged to be of such construction as to wear for several years, without renewal of packing.

Denison & Bradley, No. 55 Cliff street, New York, exhibit specimens of pumps of novel construction. An india rubber tube is bent into circular form, and placed within a metallic ring. Friction rollers operated by a crank in the center of the circle, revolve around and pass the rubber against the metallic ring, thus alternately collapsing the tube, producing a vacuum and ejecting the water. See SCIENTIFIC AMERICAN, Vol. 11, page 324, for engraving and description of this novel invention.

A. W. Gay & Co., New York, exhibit *Warner's* patent force and lift pump, of which great things are said. The same parties also exhibit *West's* improved pump. The barrel is surrounded with an air chamber which is alleged to protect it from freezing, and render its operation more easy.

Peter W. Nefus, New York, exhibits his improved double-acting force pump, which is claimed to have the merit of throwing more water, according to the power applied, than ordinary pumps.

Edson's Patent Force Pumps, are exhibited by R. F. Washburn & Co., N. Y. They are claimed to be of great power. By throwing up the handle the water runs back, and freezing is thus prevented.

Gerard Sickles, of Brooklyn, N. Y., exhibits a new rotary pump which works well and runs easily.

[It will be seen from the foregoing that the pump department of the exhibition was very full. The united discharge of all these water forcers would almost rival Niagara.]

Marine and Stationary Governor.

Thomas Silver, of Philadelphia, Pa., exhibits his patent Governor, for steam machinery. This invention is used on the steamships of the Collins line, running between New York and Liverpool. As a marine governor it acts with the greatest success. For stationary engines it is much superior to the ordinary governors. In appearance it looks like a combination of two of the common governors, there being four balls and two pair of arms. For an engraving and description of its principles, see SCIENTIFIC AMERICAN, Vol. 11, page 356.

Rotary Engines.

Silsby, Mynderse & Co., of the Island Works, Seneca Falls, N. Y., exhibit several specimens of rotary engines made under Holly's patent. They work well. We are preparing an engraving of this invention which will shortly appear.

Buffum & Crowell, of this city, exhibit a rotary engine, which consists of a rotary disk, encased within a shell. Flap valves are employed in connection with the disk, to form the necessary abutments for the steam to act upon. The opening and closing of these valves makes a very disagreeable, clattering noise. See SCIENTIFIC AMERICAN, Volume 4, 1849, for engravings of similar engines.

Gerard Sickles, Brooklyn, N. Y., exhibits a rotary engine that operated with much success.

Book Folding Machine.

S. T. Bacon, of Boston, Mass., exhibits *North's Patent* machine for folding printed sheets. Book-folding requires great accuracy. The work is now done by hand, by girls, large numbers of whom are employed in the various publishing establishments of this country. The machine shown at the Palace is said to do the labor of thirty girls. It operates with great precision, and does the work with much greater exactitude than it is generally done by hand.

Transparent Oil Cup.

William Gee, New York, exhibited a new oil cup, for feeding oil into the cylinders, valves, bearings, etc., of engines. One of the novel features is, in having a slip of glass on the side of the cup, so that the hight of oil therein, and the quantity fed is always under the eye of the attendant, and subject to his control. The invention is highly spoken of.

Fuel Cutter.

G. C. Webster & Co., New York, exhibit Daniel's new machine for cutting up brush-wood, for kindling purposes. It is constructed somewhat after the manner of a straw cutter; it cuts up stout sticks with great rapidity. For engraving and description see SCIENTIFIC AMERICAN, Vol. 11, page 228.

Preserved Fresh Meats.

There is an interesting display of fresh pork legs of mutton, and chunks of beef, preserved at Constantine, in Africa, in 1855, without salt or spices, by the process of P. Marle, of Paris. Some of this meat, a year old, is stated to have the same flavor as newly killed meat, and to be equally as juicy. The process of preservation, we understand, consists in exposing the meat, when fresh, to weak fumes of sulphur for a few minutes, then dipping it into a hot solution of 215°, of molasses 1 part and gelatin 2 parts, until all the air is expelled, so as to coat the meat with a thin impenetrable skin to keep out the air. There are useful articles on the preservation of meats on pages 38, 90, 158, and 219, Vol. 11, SCIENTIFIC AMERICAN. Farmers and others about to lay down their winter stock of meat would do well to read those articles.

Gas Stoves.

A number of stoves—large and small—for cooking and heating by the common gas used in our streets, are exhibited in full operation by W. F. Shawe, of Boston. The jet of gas for a small stove is suffered to spread through a wire gauze cover, and the air is supplied around it by a perforated cylinder, so as to mix and spread the air and gas into a thin sheet. A small stove, with one jet from a common burner, costs $10—larger ones cost more in proportion; one with four burners costs $20. They can be used for cooking and heating, and are very convenient in cities. The air is supplied to the gas in such quantities as will produce perfect combustion with the greatest amount of heat.

Shearing and Punching Presses.

Samuel Hall, of this city, exhibits one of his patent Shearing Presses. It cuts through thick sheets of metal with great ease. Its construction is such as to impart unusual strength to the jaws between which the cutting is done.

Dick's presses for shearing, punching, etc., several forms, are exhibited by W. J. Buck, of this city.

Turning Lathe.

Albin Warth, of New York, exhibits a newly improved, self-acting turning lathe, which produces ornamental work of various kinds with great rapidity.

Mortising Machines.

Lane & Bodley, Cincinnati, Ohio, exhibit Guild's patent power mortising machine. The mortising is done by a chisel which moves up and down, like the hand mortise machines. The arrangement for stopping and starting the chisel mandrel, is simple and convenient, being done without interfering with the power and without the use of clutches or pulleys.

The movements of the chisel are under complete control of the operator. The machine works with great success, and is highly spoken of. Large numbers are in use. It is adapted to all kinds of mortising, hubs, etc. Price $100 and upwards.

Messrs. Payne & Pier exhibit a self-acting mortising machine, for general work, which operates well. The mortices are cut by an auger-shaped tool. It may be set to cut mortises of a given length and depth, and, when finished, throws itself out of gear. It is not necessary to lay off or mark the work beforehand.

Lithograph Presses.

Cummings & Balfour, of Boston, Mass., exhibit specimens of their improved Lithographic Presses. The improvements consist in a novel method of regulating the pressure applied to print from the stone, in a new way of hanging the tympan, to prevent blurring of the impression, in diminishing the friction, and in a general combination of the bearings and parts, which afford increased strength.

$350,000,000 are annually expended for ardent spirits, wine and beer, in Great Britain.

Information Respecting the Manufacture of Iron and Steel.

The New York *Tribune* of the 17th ult states that the attention of metallurgists have been directed to three new methods in the manufacture of iron and steel recently introduced into Europe. These are stated to be the inventions of Messrs. Duchatras, an Austrian officer, Bessemer, of London, and Avrill of France. The several processes of these inventors, it states, are simple, cheap, doing away with puddling, and producing steel of the first quality.

Mr. Bessemer's process was first published in our columns on this side of the Atlantic, and our readers now know that he has invented nothing. There is no inventor named Duchatras. F. Uchaticus, an Austrian officer, is the person intended by the *Tribune*. His process was described on page 309, Vol. 11, SCIENTIFIC AMERICAN.

The *Tribune* states that M. Avrill's process is superior to Bessemer's and Uchaticus', and all others, because of its simplicity and saving of fuel. It says :—

"Cast-iron serves as a point of departure. The ore in the blast furnace will come out either malleable iron or steel, according to the desire of the operator. The means employed no effect this end are a modification of the crucibles at present in use, tuyeres of oxydation on the parabolic bottom of the crucible; and lastly, what is entirely new in metallurgy, the employment of ozone."

It states that *tuyeres of ozydation* form part of Avrill's process. Why, tuyers are the nozzles of the blast pipes, and require to be made of the least oxydizable iron, or some more refractory material. There is nothing new about Avrill's tuyeres; the only thing entirely new about his process, is the use of *ozone*, as stated by the *Tribune*, and that he does not use at all. What he does use, or rather proposes to use, is pure oxygen gas, as a blast. As this invention has also been highly spoken of by foreign periodicals, we allude to it for the purpose of expressing the opinion that cheap steel cannot be manufactured by it. Every good chemist will bear us out in the opinion that pure oxygen gas cannot be manufactured cheap enough to be used as a blast in converting iron into steel; besides, it is not required, as the same object stated to be effected by it is now obtained by a process in very common use, namely, a little manganese in the crucible.

The use of ozone, as alleged, in Avrill's process, is an absurdity, for it is unfit for such a purpose, being destroyed by a heat of 140° Fah. Besides it is very expensive, because it is obtained only with the utmost difficulty, and in very small quantities, by any process. The cheap new process of M. Avrill will have to wait for success until some person discovers a cheap method of making oxygen gas, and it may be safely placed, for the present, on the same shelf with the *Paine* light, Ericsson's hot air engine, or the Static pressure engine.

The Steam Frigate Merrimac.

This war vessel—one of our six new steam frigates—made a trip from this port to Southampton, Eng., to show the Britishers a sample of what Uncle Sam's shipwrights could do in these times of improvement; and the result has been as great a surprise to Uncle John as the victory of the yacht *America*. The English papers assert that it is a noble war vessel in every respect, and that it is equal to the largest steam line-of-battle ship in the English Navy. The armament of the *Merrimac* is heavier than that of the *Duke of Wellington* of 131 guns; and it would have a decided advantage over that large ship in a free fight.

The British Navy does not contain the equals of the six new steam frigates belonging to our Navy.

Use of Guano.

At the recent meeting of the Herts (Eng.) Agricultural Association, Sir E. B. Lytton stated that within the last three years, independently of the sum expended on ordinary manures, the farmers of Great Britain had laid out five million sterling in the purchase of guano, and that within the same period a million of fresh acres had been brought into cultivation.

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W. A. P., of Mass.—You do not describe your railroad invention. We cannot, therefore, judge whether or not it is good for anything. Belts of leather will stand the coldest weather. Naphtha is a volatile fluid, made from ituminous substances, such as coal: see Webster's Dictionary. You can get it from any chemist. We do not now of any instrument to see spots through pasteboard without holding it to the light. Reckon it can't be made.

F. R., of N. Y.—We have examined your electic-magnetic engine. It seems to possess some novelty in the arrangement of its parts, but the principle by which the rotary motion is produced has been applied before. You might, perhaps, obtain a patent, but your claim would require to be limited to the particular arrangement of parts.

B. F. H., of Ohio.—We do not understand your question. You ask, "Will a syphon draw through 200 feet of pipe with a fall of seven feet?" If you mean, "Will water flow through such a pipe with such a fall?" we answer yes. If you mean "Will water rise and flow through a pipe 200 feet long rising 7 feet with a fall of 7 feet?" we say no; it will with a rise of six feet. A syphon operates without a fall by the pressure of the atmos, here.

H. N. O., of Texas.—We are glad to hear that you have resolved not to cover the light of your genius under a bushel. Many celebrated inventors have been called fools in their day by those who know nothing of the characteristics of men of genius. If they had been discouraged by such sneers and taunts our progress would have been very slow indeed. We hope you will succeed in perfecting your husking machine. Your device for keeping the flame of a candle always at the same hight is new, we have no doubt, but will it not be too expensive for ordinary use? This is the point for your consideration.

E. H. F., of S. C.—The sketch of your rotary pump has been examined. We are obliged to inform you that it does not possess anything new or patentable. We have had models of rotary pumps having springs for keeping the buckets always in their proper place. The other features are not new. We advise you to drop it.

S. Y. of N. Y.—We are glad you have received your patent, and we thank you for your complimentary remarks on our mode of doing your business. We will endeavor to serve any of your neighbors and friends who entrust us with their business, as faithfully as you flatter us in having done yours.

A. H. R., of Mich.—We have never seen the work called the "Tinman's Guide," and do not know who is its publisher.

J. C. D. & B., of Mich.—The plating of metals with silver is performed with the galvanic battery; but you can silverize them by any of the receipts published in recent numbers of the Sci. Am. Smee's work on electro metallurgy will give you the requisite information about electro-plating. Your subscription expires with No. 13.

J. D. A., of Ohio—There is nothing patentable in your invention. The principle of the arrangement of the pistons is substantially the same as that of an old English invention, known as Bodmer's Engine, and the same principle has been employed here by W. W. Virdin of Havre de Grace, Md.

W. M. A., of Ohio—Clock gearing has been applied to operate fans for brushing away insects. There is no chance for a patent on the plow shown in your letter of the 25th inst.

J. A. B., of Ky.—We cannot furnish you with the receipts of Moffit's Life Pills and Phenix Bitters.

E. W. Force, New Freedom, York Co., Pa.—Wishes to purchase a quarter cut-off second-hand steam engine of about 60 horse power.

J. C. P., of La.—We do not think it possible to construct a machine that will harvest grass and wheat perfectly—shat can be also adapted to cutting corn stalks.

A. L. L., of Conn.—Good drawing tools are quite costly. Your best way will be to select them yourself. We fear we could not suit you. The cost will be from $5 to $75, according to number and finish.

A. L. Flood, of Boston, Mass., wants a copy of Cupper' work on stair building.

A. B. C., of Boston—Can address a line to S. R. Fuller of Hudson, N. Y., in regard to a buckwheat huller.

W. J. W., of Geo.—You can procure such an engine as you want of Wm. Burdon, 102 Front street, Brooklyn. $2 received.

G. C. D., of N. Y.—Look back over our paper for a year past and you will see several engravings of new windmills: among so many good ones we cannot say which is the best. Read the descriptions and satisfy yourself. Address the inventors for prices.

T. C. H., of Boston.—If the African india rubber were oiled for a considerable period—how long would have to be tested by experiment—we think its sticky charac ter would be removed.

S. V. of Phila.—You no doubt can fine good works on acoustics in any of the bookstores in your city.

Money received at the Scientific American Office, on account of Patent Office business for the week ending Saturday, Nov. 1, 1856:—

G. L. of Ill. $25; W. B. of Tenn. $30; S. B. H. of N. Y. $25; N. L. of N. J. $30; G. S. of Mass. $25; G. W. D. of N. Y. $25; L. A. H., of Ill. $30; R. D. of Vt. $30; E. E. of Ill $40; F. H. of N. Y. $30; A. E. W. of Iowa, $30; C. W. of Conn. $25; A. P. G. of Mo. $10; T. V. of Cal. $20; A. S. B. of Mass. $10; W. D. A. of N. Y. $250; T. H. of Pa. $25, J. S. of O. $20; S. E. T. of N. Y. $30; S. P. W. of N. Y. $30; N. J. M. of Ind. $40; L. M. of Pa. $25; E. & G. of Vt. $25; J. W. R. of Ohio $50; T. F. H. of Ohio $30; W. M., of Mass $25; S. W. R. of Mass. $30; G. W. S. of Conn. $30; J. S. B. of N. Y. $25; J. J. W. of N. Y. $25; C. & McD. of L. I. $25; S. L. H. of N. Y. $25; I. V. F. of N. Y. $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 1:—

G. S. of Mass.; T. R. H. of Conn.; J. S. B. of N. Y.; G. W. D. of N. Y.; J. J. W. of N. Y.; G. L. of Ill.; S. B. H. of N. Y.; L. M. of Pa.; C. H. B. of N. Y.; A. B. W. of Ct.; T. V. of Cal.; C. & McD. of L. I.; E. & G. of Vt.; E. F. of Conn.; T. H. of Pa.; C. W. of Ct.; W. M. of Mass.; S. L. H. of N. Y.; J. H., Jr., of N. Y.

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Science and Art.

Galvanic Metals.

Any two metals put into a liquid and connected together, will produce a current of electricity and form a battery, if one of the metals be capable of oxydizing in the liquid, (or if both have that property, and one oxydizes more rapidly than the other.) The power of a battery, therefore, must depend upon the difference of oxydization between the two metals employed in it. Platinum is the least and zinc the most oxydizable metals employed in batteries; therefore they should form the most powerful battery plates, when employed together, the former as the negative, and the latter as the positive pole. But there is another law connected with metals, which has an equal effect with that of decomposition in the construction of a battery, that law is *conduction*. Thus one metal will transmit a current through it easier than another—offers less resistance to its passage—hence this must be taken into consideration. Although platinum is a better negative metal in a battery than copper, it is five times less efficient as a conductor to transmit the current back to the zinc or positive plate. This is the reason why copper and zinc plates are about the best elements that can be used for galvanic batteries. Iron is a very oxydizable metal, and would form excellent positive plates, were it not such a poor conductor, it being to zinc as 24 to 40.

Etching on Ivory.

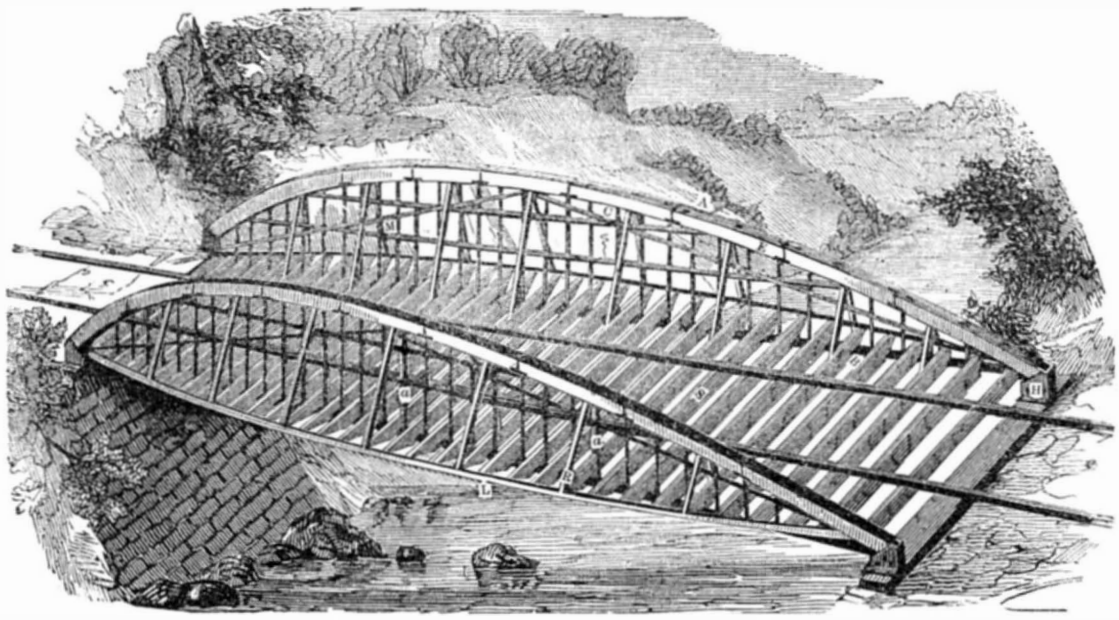
The ivory to be etched is first covered with a thin coat of wax, and the designs traced on it with a style. Nitrate of silver—composed of 6 grains of silver dissolved in 30 grains of nitric acid, then diluted with 150 grains of water—is then poured upon the ivory, which bites lightly into the lines traced by the style, and when exposed to the light, dyes it a deep black color. The wax is then removed by washing in hot soft water, leaving the design in dark lines on the ivory.

New Bridge.

Figure 1 is a perspective view of the bridge, and figure 2 is a section of the girder extending from the shoe, H. Similar letters refer to like parts on both figures.

The Girders which form the subject of this Bridge are each composed principally of an arch, A, string piece, B, forming a chord to the arch and supporting the floor, suspension rods, *a a*, arranged radially to the arch to suspend the string pieces therefrom, and diagonal braces, M. The arch is composed of two continuous lengths of wrought angle iron, C, arranged side by side, the thickness of the suspender rods, *a a*, apart, and supporting at short distances, a series of wrought or cast-iron spurs or double skew-backs, firmly bolted on, which receive tightly between them square timbers, E, which are bolted to the angle-iron string pieces, B. In this manner an arch is formed, the under part of which is well calculated to resist tensional force, and the upper part to resist compressive force, such being the forces respectively brought into action by any weight applied to the arch The string piece, B, forming a chord to the arch, is composed of two continuous pieces of angle iron, arranged the thickness of the suspenders, *a a*, apart, like the angle irons of the arch. The string piece, B, is secured at its extremities by shoes, H, of wrought or cast-iron to the ends of the arch. The string pieces and the angle irons of the arch may be formed of pieces of the greatest convenient length, bolted, riveted or otherwise connected together, so as to be perfectly continuous from one extremity to the other. The suspension rods, *a a*, are made of flat bar iron, and are placed between the angle irons of the arch and the lower string piece, and secured by rivets or bolts passing through them and the angle irons. The suspension rods may be put at any convenient distance apart. The diagonal braces are flat bar iron and extend from the shoe, H, to the crown of the arch. A brace arranged as a chord extends across the arch some distance above the string piece, B. The floor timbers, S, are supported by two or more girders, and

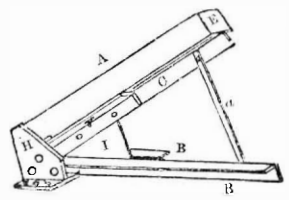
SEGMENTAL GIRDER BRIDGE



lie across the string pieces, B. The bridge is secured against lateral vibration by extending the floor timbers beyond the outside of the girders and bracing them with horizontal wrought iron braces, L, to the ends of the arch, and oblique braces, R, extending upward and inward to the arch.

The particular feature of this girder, in which it is alleged to possess advantages over all other girders, is in the construction of the arch, the lower part, consisting of continuous angle irons firmly connected together, is stated to be capable of resisting great tensional strain; and the upper part, consisting of the skew-backs and timbers fitted tightly between them, is capable of resisting great compressive force; and, at the same time, the peculiar forms of the several parts composing the arch are such that all unite in a perfectly secure manner, and that the arch can be very

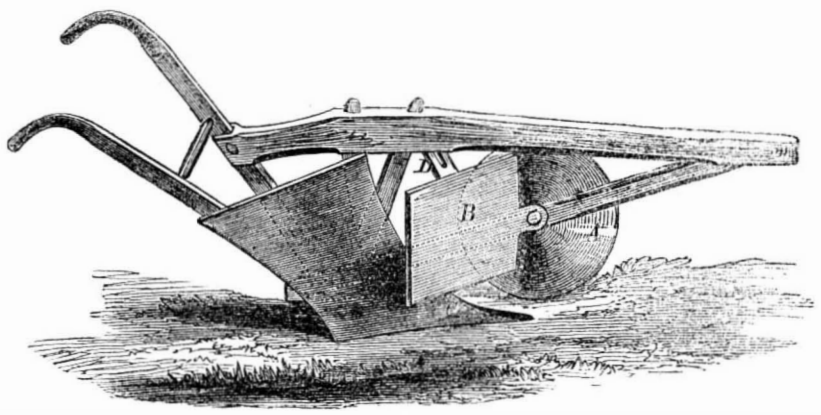
FIGURE 2.



easily constructed, and any one of the timbers between the skew-backs can, at any time when defective, be conveniently taken out and be replaced without disturbing the stability of the bridge. The other parts of the girder are so disposed as to stay the arch, and, at the same time, support the string piece at the expense of as little material as is practicable.

The inventor states that a model one hundred inches long, weighing fifty-four pounds, will sustain 8000 pounds weight and not depress the bridge in the center one-sixteenth of an inch. The bridge is constructed on scientific principles, and is, in our opinion, a valuable improvement. For further information address the inventor, Peter C. Guion, 244 Fifth street, Cincinnati, Ohio. Patented Feb 26, 1856.

IMPROVED SUBSOIL PLOW.



New Subsoil Plow.

Our engraving shows a plow of novel construction, for which Letters Patent were granted April 22, 1856, to Pells Manny, of Harvester-machine fame.

The improvement consists in having a rotary cutter, A, attached to the front part of the beam, followed by a spreading wing, B. The latter is set on an angle, enters the soil for a short distance, and turns over a shallow furrow. The mold-board, C, then lifts the soil below, and throws it up to the surface. D is a set brace extending from wing B to the plow beam. The various parts are adjustable.

As the implement is drawn along, the coulter, A, rotates and cuts the furrow slice in advance of the separating wing, B. The latter spreads or opens the furrow of the surface soil while the mold board, C, throws up the subsoil to the top of the ground. The mold board being sufficiently narrow to take up only half of the subsoil at each plowing, and being relieved from the weight of the top or surface soil by the action of the separating wing, it has such advantage in the draft as to enable it to take a much deeper furrow than ordinary subsoil plows.

The principle of this plow gives to it the desired strength, so that in its construction it is said to be as light and convenient as an ordinary plow. It will take a very deep furrow, at certain intervals, if desired, leaving a proportion of the subsoil undisturbed, in a comb, between each furrow, and within reach of a subsequent plowing. This is a new and apparently a very important principle by which a great depth may be reached and brought on top with as much facility as in ordinary plowing. The hidden treasure of the subsoil has too long been neglected for the want of suitable means to render its fertility available. Is it not absurd for our farmers to expect to outrival England in the yield per acre, when our subsoil is left undisturbed?

The inventor states that twenty years' experience has led him to believe that no fertilizers can be used on our Western prairie lands equal to a good subsoil plow. "Try it, farmers," he continues, "and if you do not find it so, I will then admit that my time and money have been spent in vain in getting up and perfecting this plow."

Address the inventor at Waddam's Grove, Stephenson Co., Ill., for further information.

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